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THE DUTY OF SCIENTIFIC MEN IN CONSERVATION[1]

THE conservation movement of a few years ago crystallized and brought to public attention a great principle, one so far reaching that its real significance and scope are even to-day not generally grasped. Regardless of how the term may be defined, the problem of conservation involves the whole question of the relation of our natural resources to the economic life and upbuilding of the country. We have to do not merely with the prevention of waste and economical use of our resources, but also with the problem of how these resources may render their highest service in building up local communities, maintaining our industries, and contributing to a strong civilization.

We can point to considerable progress in certain features of conservation during the past decade. Scientific men have conducted research of great value that already is resulting in new uses of various raw materials, in more economical methods of handling them, and in improved methods of perpetuating those resources which are renewable; engineers are giving more attention than formerly to the problem of preventing unnecessary losses in the exploitation of raw resources; the more far-sighted leaders of industry have an increasing appreciation of the relation of natural resources to the permanence of their own enterprises. And yet, the conservation principle is making slow headway, when viewed from the larger aspects of the economic needs of the country. The loss through unnecessary waste is still appalling, uneconomic methods in the use and development of various

[1] This paper was presented at a joint meeting on April 9, of three Committees on Conservation, representing the National Academy of Sciences, the National Research Council, and the American Association for the Advancement of Science.

of the resources continue, and the interests of industries and communities are already in many cases jeopardized by the depletion of local sources of raw material.

Among the obstacles to the more rapid application of the principles of conservation are ignorance and indifference on the part of those engaged in developing natural resources, unwillingness to change old methods, and selfishness of individuals who are willing to sacrifice even the interests of their own industry to immediate gains. But there are also obstacles of an economic and public character, that are retarding progress. These relate to the character of ownership and control of natural resources, to the existing organization of certain of the industries, to problems of transportation, and in some cases to questions of taxation and the relation of the public to industry.

Scientific research furnishes the foundation of conservation. Education will solve the problem of ignorance and indifference. The economic and political obstacles, however, can usually be overcome only through action by the public. Thus it is that those who are engaged in promoting the principles of conservation in their respective fields are urging legislation in the federal Congress and in state legislatures, seeking public aid for private owners of resources and for the industries, public cooperation in marketing and distribution, public action in road building and other transportation problems, and in some instances public control over the basic resources themselves, over their exploitation, or over the distribution of their products.

In studying the situation in the different fields of conservation, I have been increasingly impressed by the inadequacy of the available information about the different resources in their relation to the problems of our national development. This may be surprising in view of the extensive research in different branches of science, and the large amount of reliable data in regard to the quantity of the various resources, their basic qualities, their possible uses, and the general requirements of American industry. Yet this information has not been assembled and interpreted in a way to show the real meaning of our resources and their conservation to the permanent advancement of our industrial and social life.

Not long ago I asked a prominent leader of forestry in Massachusetts if anyone could inform me just what the forests in that state mean to its permanent economic life; the relation of the forests to wood-using industries, their importance in maintaining successful agriculture, their relation to transportation, to rural life, and to the labor problem of the state. The answer was that no such comprehensive study had ever been made. In that state as elsewhere, the discussion of forestry has centered chiefly about the problem of the production of board feet for the market. The economic aspects of forestry as a land problem have been subordinated or overlooked. Forestry concerns the use and development of nearly one third of the area of the entire country. We have the problem of whether this vast area shall be of service in building up and maintaining permanent rural communities, with all the resulting benefits to the state and to the nation. When our forest problem is studied in its relation to the concrete economic needs of the localities where the resources are located, it takes on a new aspect, it reveals a more alarming situation than if it concerned only the question of a supply of specified products, and it calls for different considerations in public policy.

Our economic studies of natural resources have thus been too restricted in their viewpoint, often overlooking aspects of great importance in formulating policies. This is especially true where the service of one natural resource is dependent upon the development and right handling of another. It is the general rule that a state or a locality is not built up on the basis of a single resource. Its economic prosperity depends upon many branches of industry using various resources some of which are obtained locally. A permanent industrial organization depends upon the right handling of all the various natural resources. The development of one may be dependent upon others; the destruction of one may re-

tard or entirely prevent further progress in the region. No better example of this principle can be found than agriculture and forestry. In many regions the forest is essential to permanent agriculture. Where the land is largely of high quality, agriculture can be carried on as an independent enterprise; where poor land predominates, successful agriculture depends upon the development of other natural resources in the region. It was the forest and the forest industries that made farming possible in many of our lean-land regions. When the forest was destroyed, and the lumber and auxiliary industries moved out, the farms were abandoned or continued under great difficulties. The forest is often regarded only as a temporary cover which is to be removed to make way for agriculture or other industrial use of the ground.

It is assumed that settlement will take place after the forest has been destroyed. Precisely this situation exists in the pine region of the South. The forests are being cleared away with great rapidity, with almost no effort to replacement. Every tree is cut that will make a log, including the young timber that has grown since the Civil War; and many thousands of acres of small trees 25 years or so of age, are turpentined under methods that will kill them within a few years. The owners then undertake to dispose of the lands for farming. The public is appealed to for cooperation in attracting settlers, and to establish colonies of farmers upon these devastated areas. If this land were of the character of that in the Mississippi and Ohio valleys, the effort would be more successful. But only a part of the land is fertile, and that is intermixed with light soils suited only to tree growth. The raising of live stock will help this situation to some extent, just as it was a great factor in the early settlement of Virginia, Kentucky, Tennessee, and other states. But in the long run it will be the forest, growing on the poor soils, that will supplement farming and stock raising and, by affording additional opportunities to the farmer and by supporting local forest industries, will make the settlement successful and permanent.

You have doubtless, most of you, visited the Landes district of southwestern France. This is an extensive sandy plain, presenting conditions similar in many respects to the coastal plain of our South. The original pine forests were destroyed, and the whole region remained for many years in a backward condition. Prior to the middle of the last century this whole area, through the initiative and cooperation of the government, was reforested. The direct result was that the tillable lands, often in small areas, were cultivated and a prosperous rural organization built up. The farmers were able to devote a part of their time to logging, to turpentining, and to work in the mills. All of the land is in use, furnishing several resources that altogether support an astonishingly large population.

I am in sympathy with the efforts to attract settlers to the South and other cut-over land districts. I am in sympathy with the plans for public cooperation in land classification. I am in sympathy with public encouragement of systematic establishment of farm colonies, even with public help as is successfully done in California. But first of all we must stop the wasteful destruction of the very resources that are necessary to make such settlement work successful. And that can be done only by a recognition of the interrelation of the problems of the various resources, and the working together of all of them to the common end of building up the country.

Many other illustrations could be given of two or more resources which are interdependent and whose problems of development and conservation cannot be considered separately without loss. Forestry and stock-raising, farming and mining, agriculture and mining, forestry and recreation, wild life conservation and grazing, water resources and forestry, water power, oil and coal, are a few examples. Oftentimes too there is a failure to consider the larger aspects of resource development in the planning and building of highways. Transportation is one of the largest factors in removing the economic obstacles to successful conservation. In the past great sums have been expended on unwisely planned roads.

Every public officer charged with selecting road routes, is subject to enormous pressure to build specific roads in aid of special industrial groups or individual interests. This was brought home to me when, during my service as head of the Forest Service, we inaugurated a large enterprise of public highways in the National Forests. In working out a policy of public highways the selection of projects and planning of the roads were based upon studies of all the various natural resources and of the local economic needs. Every road was to render its highest service in aid of resource development, in building up and maintaining permanent communities; and in this we did not overlook the encouragement of outdoor recreation through conserving the scenic values along the routes.

One of the most important problems before our country to-day is to preserve and build up a strong rural civilization. Every one at all familiar with our economic history appreciates the influence on our physical prosperity and upon the moulding of American character of the existence of a vast public domain containing a wealth of natural resources of great variety and readily available for use. It was through this surplus of resources that there was developed among our people the qualities of individuality, initiative, and self-reliance. Our national strength lies in having a great number of small land proprietors, of small entrepreneurs in all industries, an army of men dependent upon their own individual efforts rather than upon mass organization. It is for this reason that we are seriously concerned by the movement away from the country to the industrial centers, and by the increase of ratio of the industrial to the rural population. Our public domain is now but a fragment and is no longer available as a factor in assimilating the great number of aliens that are flocking to our shores. The resources that can readily be developed by the individual are approaching exhaustion; the surface cream of our natural wealth has been skimmed off.

We still possess vast resources, but their development involves new problems. The process of exploiting the more accessible resources built up a rural organization. In many cases this has broken down or its character has been changed. The building up of a sound rural civilization on a permanent basis depends first of all on how we work out the new problems of handling our natural resources.

I would not in any degree minimize the problem of conservation as it relates to the supply and distribution of raw materials for our various industries. The need of conservation from this aspect has been borne in upon our industries by the artificial shortage created by conditions growing out of the war. Less appreciated is the relation of conservation to the welfare of the localities where the natural resources occur, and it is for that reason that I have to-day laid stress upon that special feature.

The efforts in conservation to-day are scattered among a large number of institutions, organizations, and individuals. There is a lack of unified purpose and direction in the movement. Workers in separate fields fail to give adequate consideration to the bearing of the problems of other resources upon their own. Oftentimes there is an actual conflict of interests in the use and development of two or more resources that is not being adjusted and is leading to public injury. In the field of public policy many proposals are being made, each perhaps with a good purpose, which are not in harmony as to principle and often are in conflict, with resulting confusion to the public and frequent failure to secure the legislation requested.

To-day there is no central agency, governmental or otherwise, that is considering our natural resources as a whole in their relation to our economic, industrial, and social development. There is no leadership in conservation in its larger aspects, that defines objectives, assembles and interprets the basic data regarding our resources, works out the principles of harmonizing conflicting interests in resource development, that furnishes, in short, the economic background for conservation and the principles that must underlie the public action necessary to make our natural resources render their best service; and there

is no agency equipped to organize the educational work that should be introduced into our colleges and schools, aside from popular education in conservation.

It must be clear to every student of the natural resource problem that there is an undertaking in conservation of great magnitude awaiting leadership and organized effort. There is an opportunity and, in my opinion, a duty for the great national organizations of scientific men to join hands in assuming this leadership. They are in a position to bring into harmony the objectives, the policies, and the efforts of those working in the several branches of natural resources. Under their guidance and inspiration there could be assembled the available information regarding our natural resources, and the interpretation of the problems of conservation from the broad viewpoint of the relation of all resources to our national development. The scientific organizations would thus be able to contribute to the formulation of public policies, and to aid in bringing about their adoption. And finally, it would be possible for them through existing agencies to carry out an educational plan for the introduction of appropriate studies in conservation in our schools and colleges, and to forward a far-reaching campaign of popular education.

The appointment of conservation committees by the National Academy of Sciences, the National Research Council, and the Association for the Advancement of Science, and the meeting of these committees for the consideration of joint action, should prove to be the first step in a new leadership that will give power to the conservation movement, with the promise of very large achievement.

In my opinion a very great responsibility rests upon this conference. We have an opportunity to organize the intellectual forces of the country in a movement that will have a profound influence upon the future well-being of the country. Our action may determine the direction the movement may take, and whether it will be effective or lag behind for lack of leadership. A great public interest depends upon our foresight and vision, upon our ability to plan with wisdom.

HENRY S. GRAVES

PRESIDENT HARDING'S PRESENTATION ADDRESS TO MME. CURIE

Mme. Curie: It is with an especial satisfaction that I perform the pleasant duty which has been assigned to me to-day. On behalf of the American nation I greet and welcome you to our country, in which you will everywhere find the most cordial reception. We welcome you as an adopted daughter of France, our earliest supporter among the great nations. We greet you as a native born daughter of Poland—newest, as it is also among the oldest of the great nations, and always bound by ties of closest sympathy to our own Republic. In you we see the representative of Poland, restored and reinstated to its rightful place; of France, valiantly maintained in the high estate which has ever been its right.

As a nation whose womanhood has been exalted to fullest participation in citizenship, we are proud to honor in you a woman whose work has earned universal acclaim and attested woman's equality in every intellectual and spirtual activity.

We greet you as foremost among scientists in the age of science, as leader among women in the generation which sees woman come tardily into her own. We greet you as an exemplar of liberty's victories in the generation wherein liberty has won her crown of glory.

In doing honor to you we testify anew our pride in the ancient friendships which have bound us to both the country of your adoption and that of your nativity. We exalt anew our pride that we have stood with them in the struggle for civilization, and have touched elbows with them in the march of progress.

It has been your fortune, Mme. Curie, to accomplish an immortal work for humanity. We are not without understanding of the trials and sacrifices which have been the price of your achievement. We know something of the fervid purpose and deep devotion which in-

spired you. We bring to you the meed of honor which is due to preeminence in science, scholarship, research and humanitarianism. But with it all we bring something more. We lay at your feet the testimony of that love which all the generation of men have been wont to bestow upon the noble woman, the unselfish wife, the devoted mother. If, indeed, these simpler and commoner relations of life could not keep you from attainments in the realms of science and intellect, it is also true that the zeal, ambition and unswerving purpose of a lofty career could not bar you from splendidly doing all the plain but worthy tasks which fall to every woman's lot.

A number of years ago a reader of one of your earlier works on radioactive substances noted the observation that there was much divergence of opinion as to whether the energy of radioactive substances is created within those substances themselves, or is gathered to them from outside sources and then diffused from them. The question suggested an answer which is doubtless hopelessly unscientific. I have liked to believe in an analogy between the spiritual and the physical world. I have been very sure that that which I may call the radioactive soul, or spirit, or intellect—call it what you choose—must first gather to itself, from its surroundings, the power that it afterward radiates in beneficence to those near it. I believe it is the sum of many inspirations, borne in on great souls, which enables them to warm, to scintillate, to radiate, to illumine and serve those about them. I am so sure of this explanation for the radioactive personality that I feel somehow a conviction that science will one day establish a like explanation for radioactivity among inanimate substances.

Perhaps, in my innocence of science, I am airily rushing in where scientists fear to tread. But I am trying to express to you my conviction that the great things achieved by great minds would never have been wrought without the inspiration of an appealing need for them. That appeal comes as inspiration to successful effort, and success in turn enables the outgiving of benefits to millions whose only contribution has been the power of their united appeal.

Let me press the analogy a little further. The world to-day is appealing to its statesmen, its sociologists, its humanitarians and its religious leaders for solution of appalling problems. I want to hope that the power and universality of that appeal will inspire strong, devout, consecrated men and women to seek out the solution, and, in the light of their wisdom, to carry it to all mankind. I have faith to believe that precisely that will happen, and in your own career of fine achievement I find heartening justification for my faith.

In testimony of the affection of the American people, of their confidence in your scientific work, and of their earnest wish that your genius and energy may receive all encouragement to carry forward your efforts for the advance of science and conquest of disease, I have been commissioned to present to you this little phial of radium. To you we owe our knowledge and possession of it, and so to you we give it, confident that in your possession it will be the means further to unveil the fascinating secrets of nature, to widen the field of useful knowledge, to alleviate suffering among the children of man. Take it to use as your wisdom shall direct and your purpose of service shall incline you. Be sure that we esteem it but a small earnest of the sentiments for which it stands. It betokens the affection of one great people for another. It will remind you of the love of a grateful people for yourself; and it will testify in the useful work to which you will devote it, the reverence of mankind for one of its foremost benefactors and most beloved of women.

HENRY PLATT CUSHING

The death of Professor Cushing in the month of April last at his home in Cleveland, has already been announced in these columns. His colleagues on the Geological Survey of New York wish to pay the following brief tribute to his friendship and worth. His scientific work is a part of the enduring records of the survey with which he was associated for twenty-eight years. His name will be forever

associated with the scientific exploration of the Adirondack Mountains, the most picturesque part of the State of New York, the great playground of the people of this and other states. In 1893 Cushing, with James F. Kemp and C. H. Smyth, Jr., entered this difficult field for the purpose of intensive investigation of its geological structure. For more than one generation it had been a common remark among intelligent people that the Adirondacks were "the oldest rocks on earth," but except in broadest features their structures were not understood or the relations of their mountain-making rock masses, one to another, comprehended. Professor Kemp, conceiving the importance of a systematic attack on this resistant field where geological information had lagged so far behind the rest of the state, brought together this little trinity of workers under the auspices of the state survey and its joint activity continued for many years; and though the attack eventually became a desultory one by two of the three, Cushing's part went on without interruption. He was a fine geologist in a difficult field, keen, patient, with the factors of his problem fully in hand; an excellent petrologist with a perfectly competent understanding of the dynamics of the Precambrian rocks. His grasp of the complicated Precambrian history of New York and the succession of events composing it finally enabled him to tell the story in his "Geology of the Northern Adirondacks." From the beginning of his field work in New York Professor Cushing showed that he was quite as competent to carry on the work in the unaltered sedimentary rocks, even in the intensive way which present requirements demand. He was a manly, frank, open-hearted and devoted student of his science, who challenged respect for his work and engaged the deep attachment of those who were admitted to his friendship.

JOHN M. CLARKE

WHEN Cushing began his work in the Adirondack region in 1893 the pre-Cambrian rocks, excepting the area in which Kemp was working, had been studied only very locally or by the aid of antiquated methods which led to quite erroneous conclusions. An assemblage of crystalline limestone, quartzites, schists and gneisses was clearly of sedimentary origin, while certain massive rocks were as clearly igneous. There were also extensive areas of gneisses and schists of doubtful origin. To determine the origin of these rocks, together with the structural and age relations of the various formations, was the fundamental problem. Working at first in the northeastern part of the region, Cushing had to deal mainly with rocks that proved to be igneous, and he was able to establish not only their origin but also, to a large extent, their time relations, and particularly that of the very extensive anorthosites and syenites. The work was later extended to the southern edge of the Adirondacks and, finally, to the northwestern part, his last paper being a report on the Gouverneur quadrangle, now in press.

In this district he came in contact with extensive areas of the Grenville sedimentary series, and worked out in detail their relations to the granites, syenites and gabbros. In this work he emphasized the relatively slight erosion of the crystalline rocks as compared with districts to the east, with the resultant partial, or complete, survival of the roofs of batholiths. In the course of these years of field and laboratory study he gathered a great mass of data which afforded the basis for important papers dealing with differentiation, assimilation, and other petrologic problems. In this work he was greatly aided by a series of highly accurate analyses of rocks made for him by his friend, Dr. E. W. Morley.

One can not look over Cushing's publications on the Adirondack region, even casually, without being impressed by the great volume of work represented, and the wide range of problems treated. The more carefully his papers are studied, the more evident is the wealth of accurate observation and carefully reasoned conclusions contained in them. They constitute a brilliant record of achievement in a difficult field of research.

C. H. SMYTH, JR.

Although Professor Cushing was primarily interested in Precambrian lithology and stratigraphy, he was led into stratigraphic investigation of the Paleozoic formations by his work along the margin of the Adirondack massive and his desire to read the history of this region from the overlapping and surrounding Paleozoic rocks. He was a pioneer in this work, and by his method of carefully noting and comparing the lithologic characters, relative thicknesses and amounts of overlap on the Precambrian, as well as the fossil contents of the various Paleozoic formations, he was able to trace the unequal emergences and submergences of the different sides of the Adirondack massive.

He began at the northeast corner of the Adirondacks, in Clinton county, where he early recognized the great thicknesses of the Potsdam and Beekmantown formations and their thinning westward and southward, implying the more rapid and steady subsidence of the northeastern part of the Adirondacks in Late Cambrian and Early Ordovician time. Then at the southwest corner he found the successive overlap of the Ordovician formations, notably of the Beekmantown and Trenton, upon the comparatively even Precambrian floor and thus inferred a relatively even sinking of this side of the Adirondacks in Early and Middle Ordovician time, interrupted by an elevation in Chazy time.

In the "Geology of the Northern Adirondack Region" the Paleozoic history of the Adirondacks is for the first time treated logically by a comparison of the Paleozoic deposits on all four sides. This work also showed Cushing where correct data were still lacking for a more comprehensive treatment of his subject. These data were supplied by his later work (jointly with Ulrich and Ruedemann) on the Paleozoics of the Thousand Islands (northwest corner), Saratoga Springs (northeast corner) and Ogdensburg (north side) regions. It was his intention to continue the work in the Watertown region together with Ruedemann. Jointly with these co-workers he reached the conclusion that the Paleozoic rocks which rim the Adirondacks consist largely of the thinner, near-shore edges of a great number of formations, and that there is a great lack of correspondence between the formations on the different sides. This conclusion found its expression in a more refned distinction and correlation of formational units in the Paleozoic rocks surrounding the Adirondacks.

Cushing's stratigraphic work has left its indelible impress upon the elaboration of the geologic history of New York. He was equally keen and enthusiastic in studying the lithologic and structural, as well as the stratigraphic and faunistic characters of the formations; and those who had the good fortune to be associated with him in the field will never forget his vigorous sterling character, cautious and fair weighing of all evidence, and his fine sense of humor.

R. Ruedemann

SCIENTIFIC EVENTS

AN ENGLISH HOSPITAL FOR NERVOUS DISORDERS

We learn from the London *Times* that Sir Ernest Cassel has given £225,000 to found and endow a hospital or sanatorium for the treatment of functional nervous disorders, and the King and Queen have consented to become patrons of the new institution. Sir Ernest Cassel has purchased a fine mansion and park in ideal surroundings at Penshurst, Kent, for the purpose. The house, which has been reconstructed, will accommodate about 60 patients, and was opened on May 23.

By the term "functional nervous disorders" will be understood those common but complex and distressing conditions which are not the direct outcome of organic disease. Among such may be named neurasthenia, nervous break-down, loss of power not associated with evident structural changes, together with those manifold kindred troubles which are loosely termed "nervous." Largely the result of the stress and turmoil of modern life, they are unfortunately of great frequency and are accompanied by much suffering, and followed, not uncommonly, by disastrous mental and physical consequences. Subjects of these dis-

orders often become incapacitated and remain so for want of the particular treatment they require. For such treatment scarcely any facilities exist at the present moment. To say that a condition is merely due to "nerves" has been almost equivalent to saying that it calls for nothing beyond rest and change. These disorders are, however, amenable to medical treatment under favorable conditions, and it is to provide such means of cure and further to expand and elaborate them that the present institution has been founded.

The hospital is primarily intended for those members of the educated classes who are unable to meet the heavy expenses associated with care and treatment in a nursing home. The upkeep of the institution and the treatment of the patients have been largely provided for by the generosity of the founder, but a charge will be made to each patient as a contribution to his or her maintenance.

The members of the general committee, under the chairmanship of Sir Ernest Cassel, are Sir Robert Hudson, Sir Courtauld Thomson, Sir Felix Cassel (the trustees of the fund), and Mrs. Joshua, together with the members of the medical committee, Miss Aldrich-Blake, M.S., Dr. Farquhar Buzzard, Sir Maurice Craig, Lord Dawson, Professor J. S. Haldane, Dr. Henry Head, Dr. A. F. Hurst, and Sir Frederick Treves. Dr. T. A. Ross, who has had a wide experience of diseases of the nervous system, has been appointed medical director.

THE GIFT TO MME. CURIE

THE deed of gift, which accompanied the gram of radium presented to Mme. Curie by President Harding on May 27 reads:

This agreement, made this 19th of May, 1921, between the Committee of Women of the Marie Curie Fund, of 3 Macdougal Street, New York City, and Mme. Curie, of Paris, France, witnesseth:

WHEREAS a gram of radium has been secured through the efforts of the above mentioned committee and by the voluntary subscriptions of the women of the United States for the purpose of presentation to Mme. Marie Curie for free and untrammeled use by her in experimentation and in pursuit of science,

Now, therefore, in consideration of the object above set forth and in order that the fullest scientific use may be made of such material, the said executive committee of the Mme. Curie Fund, as representing the subscribers thereto, does hereby give, grant and transfer to Mme. Marie Curie the said gram of radium, to be used and applied by her freely and in her discretion in experimentation and in the best interests of science by herself personally, or under her direction or through such agencies, assistants and successors as she may nominate, and in the confident expectation that Mme. Curie will take measures as will insure the continued use of the said material for the purposes stated, in case of her withdrawal from activities or other disability through such persons as she may adjudge best qualified for the purpose.

RUINS IN THE UPPER CANADIAN VALLEY

IN March and April, Messrs. W. K. Moorehead and J. B. Thoburn travelled through the Upper Canadian valley and the Panhandle of Texas and eastern New Mexico, continuing the explorations begun last spring in that region. They discovered that the small buildings and house foundations which are supposed to have marked the beginning of the Pueblo-Cliff Dweller culture extended through New Mexico to the foot of the continental divide. In the Mora valley they found seven or eight small ruins and one L-shaped structure 200 x 150 feet which were distinctively Pueblo. On the surface, and by means of excavation, broken pottery of black and white design was found. This was archaic Pueblo—the earliest type. In Ute and La Cinta canyons were found rock shelters and caverns which had been inhabited by Indians. Many more petroglyphs were also discovered.

The results of this expedition are said to confirm the observations made last year to the effect that a new field in American archeology has been opened and that Indian remains extend through a territory approximately 250 x 150 miles.

GEOLOGICAL EXPEDITION TO CHINA

A PARTY of six geologists and mining engineers from Minnesota and Wisconsin, includ-

ing Professor W. J. Mead, of the department of geology, W. R. Appleby, of the school of mines, University of Minnesota; Professor W. H. Emmons, University of Minnesota; Frank Hutchinson, consulting engineer, Duluth, Minn.; L. D. Davenport, mining engineer, Hibbing, Minn.; and W. H. Graigo, mining engineer, recently of South Africa, of the University of Wisconsin, will go to China this summer as consulting experts for the South Manchuria Railway company. The party will sail from Seattle early in June and return in October. Professor Mead writes:

> The South Manchuria Railway company controls partly developed iron and coal deposits near Mukdan, South Manchuria. The iron deposits resemble geologically those of the Lake Superior region. The railway company has employed a group of technical men familiar with the Lake Superior iron mining industry to make a thorough investigation of the Manchurian deposits during the coming summer and to advise on the best methods of opening up and developing both the iron ore and the coal.

EXPEDITION TO THE UPPER BASIN OF THE AMAZON

An expedition to the headwaters of the Amazon River, under the leadership of Dr. H. H. Rusby, dean of the school of pharmacy of Columbia University, will sail for Antofagasta, Chile, on June 1. The main object of the expedition, which is financed by the H. K. Mulford Company, is the collection of herbs and plants likely to be of use in medicine, but studies will be made of the fauna and flora of the region.

Dr. Frederick L. Hoffman, statistician and vice-president of the Prudential Life Insurance Company, will accompany the expedition to make a study of health conditions with a view to the possibility of the acclimatization of white men in the region. Other members of the expedition are: Dr. William M. Mann, assistant entomologist of the Bureau of Entomology of the U. S. Department of Agriculture, in charge of entomology; Dr. Everett Pearson, University of Indiana, in charge of ichthyology; Dr. Orland E. White, of the Brooklyn Botanical Garden, representing Harvard University, in charge of botany; and George S. McCarthy, of Woodbury, N. J., taxidermist.

From Antofagasta, the expedition will travel by way of the Guggenheim mining properties to La Paz, Bolivia. From La Paz it will pass through unexplored territory, crossing the Andes at an elevation of more than 19,000 feet. Calomar will be used as a base for the expedition.

SCIENTIFIC NOTES AND NEWS

The Royal Society on May 5 elected as foreign members Dr. Albert Calmette, of the Pasteur Institute; Dr. Henri Deslandres, of the Paris Observatory; Professor Albert Einstein, of the University of Berlin; Professor Albin Haller, of the University of Paris; Professor E. B. Wilson, of Columbia University, and Professor P. Zeeman, of the University of Amsterdam.

Professor George C. Whipple, of the Harvard Engineering School and the Harvard Technology School of Public Health, has been elected an honorary fellow of the Royal Sanitary Institute of Great Britain.

Dr. Otto Klotz, director of the Dominion Observatory, Ottawa, has been elected president of Section III. (Mathematical, Physical and Chemical Sciences) of the Royal Society of Canada.

The following officers were elected at the annual meeting of the Kentucky Academy of Sciences on May 14:

President, George D. Smith, Eastern Kentucky State Normal School, Richmond, Ky.

Vice-president, Lucien Beckner, Winchester, Ky.

Secretary, A. M. Peter, Experiment Station, Lexington, Ky.

Treasurer, Chas. A. Shull, University of Kentucky, Lexington, Ky.

Member of Publications Committee, D. W. Martin, Georgetown College, Georgetown, Ky.

Representative in the Council of the American Association for the Advancement of Science, A. M. Peter.

Dr. A. R. Mann, dean of the New York State Agricultural College at Cornell Uni-

versity, has declined the post of New York State Commissioner of Agriculture, to which he was recently appointed by the State Council of Farms and Markets.

ROBERT C. DUNCAN, physicist at the Bureau of Standards, has resigned to accept a position as technicist for the Bureau of Ordnance, Navy Department.

MR. B. H. RAWL, assistant chief of the Bureau of Animal Industry, U. S. Department of Agriculture, has resigned to take charge of the educational work of the California Central Creameries, with headquarters in San Francisco.

DR. W. K. GREGORY sailed for Sydney, New South Wales, on May 31, to enlist the cooperation of Australian museums with the American Museum of Natural History and to secure material for the Australian Hall of the Museum.

MR. W. L. G. JOERG, of the scientific staff of the American Geographical Society of New York and editor of its Research Series, left on May 21 on a six months' leave of absence for a trip to Europe on behalf of the society to study the present status and tendencies of geography in Europe and to establish closer relations with kindred workers and institutions.

DR. H. H. WHETZEL, head of the department of plant pathology at Cornell University, has been granted sabbatical leave for the year 1921–22. He will sail on June 8 for Bermuda, where he is to be associated with the Department of Agriculture of the Islands in plant disease survey and research work. Dr. L. M. Massey will be acting head of the department in the absence of Professor Whetzel.

A BOTANICAL garden, established as part of Albany's park development program in cooperation with the Albany College of Pharmacy, which will contain every plant grown in the state, is included in the new college plans. According to Dean Mansfield, the garden will be one of the most complete of its kind in the United States and will be arranged after the plan of the London and Paris botanical parks.

UNIVERSITY AND EDUCATIONAL NEWS

OFFICIAL announcement is made in *Yale Alumni Weekly* of the construction in the immediate future of a new chemical laboratory by Yale University. It will be known as the Sterling Chemical Laboratory and will be constructed to accommodate all the undergraduate and graduate chemical activities of the university. At present the department of chemistry is occupying the two departmental laboratories, Kent and Sheffield, which are inadequate to meet the future growth of the department.

A MEMORIAL has been presented to the council of the Senate of the University of Cambridge for a syndicate to be appointed to consider possible alterations in the Mathematical and Natural Sciences Triposes with the object of facilitating the acquisition by candidates in one subject of a knowledge of the other.

PROFESSOR R. A. DUTCHER of the department of biochemistry will leave the University of Minnesota at the end of the school year to become head of the department of chemistry in the college of agriculture at Pennsylvania State College.

PROFESSOR A. D. ROSS, professor of mathematics and physics and formerly vice-chancellor of the University of Western Australia, Perth, has been elected a member of the governing body of the university.

IT is proposed to appoint Professor H. Lamb, now in residence in the University of Cambridge, to an honorary university lectureship to be called the Rayleigh lectureship in mathematics.

DISCUSSION AND CORRESPONDENCE

THE AURORA OF MAY 14, 1921

A VERY bright auroral display was observed here on the evening of May 14. The sky was overcast until 10 P.M. eastern standard time. As the clouds dissolved, the aurora was noted in spite of the bright moonlight.

The focus of the display was near the zenith in the vicinity of the star Arcturus. From that point streamers radiated in all directions,

constantly changing both in position and in intensity. Across these streamers, pale green pulsating clouds drifted, in general from north to south, but occasionally assuming a spiral form around the zenith. They attained their maximum brightness near the zenith where they were especially conspicuous on account of their almost instantaneous changes in intensity.

Bright colors were not noticed during the evening, but after the moon set about midnight, pale reds and blues appeared on the edges of the streamers and clouds. The display continued at intervals throughout the night. It was not more conspicuous in the north than in other directions.

The aurora was undoubtedly due to the very large group of sun-spots which had just passed the center of the sun's disk.

Frederick Slocum

Middletown, Conn.,
May 15, 1921

Against a clear, moonlit sky, a brilliant auroral display was observed at Ames, Iowa, between 8:30 and 10:30 P.M. on May 14. The arch which was visible throughout this time except at short intervals, formed in our magnetic north and extended about 15 degrees above the horizon.

As the streamers, which were predominantly white, grew in number, in length and in extent along the horizon, they converged to a focus at a point somewhat variable in position but approximately 15° south and 5° west of the zenith, which point, the magnet zenith, became a center of radiation for the streamers. Abouth 15 minutes before the maximum development of the display, streamers of red were seen to rise from the horizon a few degreees south of east and to extend through the radiant center to the horizon about the same distance north of west, forming an arch along a magnetic parallel.

The maximum degree of brilliancy was attained at 9:27, when the streamers from a large coronal area formed about the magnetic zenith extended to the horizon in all directions, lighting the entire heavens. The radial streamers were visible within a few degrees of the moon, which had just passed the first quarter. At this time a dark area a few degrees west of south on the horizon closely resembled an auroral arch, but a definite segment of a circle like that on the northern horizon could not be discerned.

The shades, tints and hues, changeable and increasing from the beginning of the observation, now became more distinct and all of the primary colors appeared in varying degrees of intensity. Reappearing intermittently, the colors gradually faded away during the remaining hour of the display.

John E. Smith

Department of Geology,
Iowa State College

RUSSIAN GEOLOGISTS

The sad fate that has befallen many of the leading Russian geologists and mineralogists constitutes a gloomy chapter in the history of these sciences. From particulars gathered by Professor Sederholm, of Sweden,[1] and confirmed by a personal letter of March 30, 1921, received from Dr. Cornelius Doelter of Vienna, the following data have been secured.

Of some seventy Russian specialists in these fields eleven are dead. Of these, there died in Petrograd the well-known Professors Inostranzer, Fedorov (who died of hunger), Karakash, Derzhavin and Kasanski. Professor Sokolov died in Moscow. Professor Armasevski was shot in Kiev, as were Professors Samiatin and Mitkyevich in Petrograd. Stopnjevich died of smallpox and Snertkov of hunger-typhus. Baron Rebinder committed suicide, and it is reported that Faas is seriously ill.

The president of the Petrograd Academy of Sciences, and former director of the Geological Institute, Alexander Karpinsky, the Nestor of Russian geologists, who is now eighty years old, lives with his three daughters, a son-in-law, and his grandchildren, in a cold kitchen, and suffers great deprivation be-

[1] Given by Professor Mohr in *Centralblatt für Mineralogie, Geologie und Paläontologie*, 15 Jan., 1921, No. 2, p. 60, from the *Svenska Dagbladet*.

cause of the lack of necessaries of life, although his scholars, with touching zeal, bring everything they are able to secure.

Professor Andrussov and the Academician Vernadsky were fortunate enough to make their way to South Russia, and it is stated that the latter seems to be in good circumstances, as he has founded a new academy of sciences in Kiev, and also a new university in Simferopol. About ten of these scientists fled across the frontier, and escaped to Finland or Poland, or even to America or Japan, and perhaps as many more are scattered through Siberia. From fifteen to twenty are probably in the Russian provinces, but only about ten are managing to exist in Petrograd.

The famous mineralogist Fedorov, whose death from hunger we have noted, was the first to proclaim, at a meeting in St. Petersburg, in 1889, the great advantages that would result from the application of the principle of the theodolite to goniometrical researches. Four years later, in 1893, he published his classic work, "The theodolite method in mineralogy and petrography."[2]

G. F. K. AND E. T. W.

SCIENTIFIC BOOKS

The Coccidæ. Tables for the Identification of the Sub-families and Some of the More Important Genera and Species, together with Discussions of their Anatomy and Life History. By ALEX. D. MACGILLIVRAY. Scarab Company, Urbana, Ill., 1921. Pp. viii + 502. $6.00.

Entomologists who have been acquainted with Dr. MacGillivray's thoroughgoing studies of the scale-insects have long awaited the appearance of this volume. The material was originally collected for the use of students in the identification of Coccids. Prepared in its first draft about fifteen years ago, it has been greatly extended, modified and revised as it was being tested out in laboratory and class work.

[2] W. W. Nikitin, "La Méthode universelle de Fedorov," French transl. by Louis Duparc and Véra de Dervies, 2 vols. Geneva, Paris and Liège, 1914, Vol. I., p. 6.

In no group of insects of equal importance is so much reliance in systematic work placed upon minute structural details. Many a would-be student of the group has been deterred by difficulties of preparation of material and by lack of a comprehensive discussion, in English, of the morphology. To such the volume will prove a veritable boon.

A chapter is devoted to details of technique. In this are considered necessary equipment, tools, clarifying and the various stages in the making of permanent preparations. This is followed by a chapter on the external anatomy of the Coccidæ. The "great number of species and the dearth of usable characters, because of the simplification of their external form and structure, makes it necessary to employ every available structure." In spite of the lack of illustrations, the discussion and definition of these structures is clear-cut.

Figures were omitted for pedagogical reasons.

> The tables were prepared primarily for the use of students. Those who have had any experience in teaching know that most students will not undertake anything they are not forced to do. The omission of figures makes it necessary for them to study their specimens rather than figures.

The autnor's detailed studies on the phylogeny of the different subfamilies, genera and species have led him to the establishment of a considerable number of new genera, which are here defined for the first time. The group as a whole he divides into seventeen subfamilies, which have been treated in an ascending order. A tabular arrangement indicates what the author believes to be the relation of these subfamilies, and the scientific and vernacular names that have been applied to them.

Dr. MacGillivray has done a real service in making the materials of his course available to a wider audience. The book will prove indispensable to future students of the Coccidæ.

WM. A. RILEY

The Soils and Agriculture of the Southern States. By HUGH HAMMOND BENNETT, of

the Bureau of Soils, United States Department of Agriculture. The Macmillan Company, New York. 1920. Pp. xviii + 399. Illustrations: 56 plates, general soil map of the Southern States (frontispiece), and four additional maps.

This book departs from the usual trend of books on soils in that instead of dealing with the properties and nature of soils in general the author describes the origin, geographic distribution, physical characteristics, agricultural adaptations and management of all the important soils occuring in the area under discussion. The states included in the work are those lying south of the north boundaries of Delaware, Maryland and West Virginia, south of the Ohio River, and south and east of and including Missouri, Kansas and Texas.

In the introduction the author explains the division of the country under consideration into soil provinces and subordinate soil regions, and describes the United States Bureau of Soils system of classification and nomenclature of soil series and types. The introduction further takes up the geographical distribution and in general the adaptation to different soils of the various crops grown in the South; and the influence of climate on soils and crops.

The general geography, topography, geology and agriculture of each soil province and its subordinate soil regions are discussed, followed by detailed descriptions of the individual soils. These descriptions include the location, physical and frequently chemical characteristics, topography, drainage and crop adaptation of each soil, and methods of soil management and fertilization which actual farm practise and experimentation have proven to be most effective.

Four appendixes include discussions of the meanings of terms used in soil classification, chemical analyses of representative southern soils, a bibliography of important publications on soils and related subjects, and statistics bearing on some of the important farm products of the southern states.

The book is valuable not only to students and agricultural investigators but also to farmers and especially to those contemplating settling in the south.

Wm. B. Cobb
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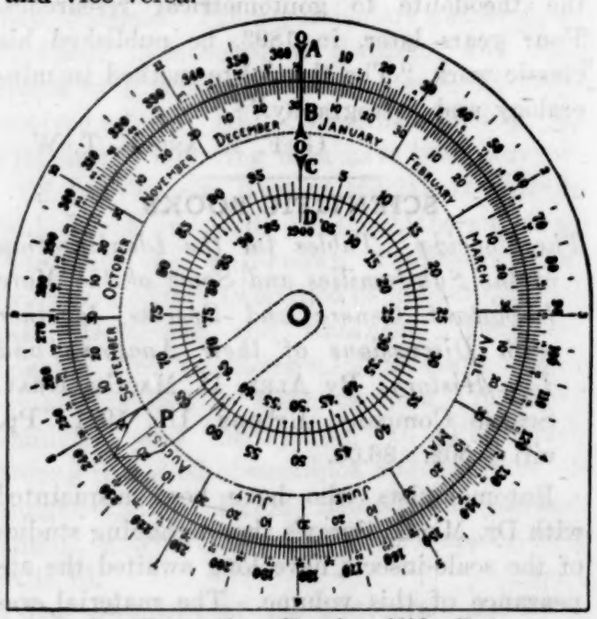
SPECIAL ARTICLES

AN AGE-COMPUTING DEVICE

1. In a recent issue of Science (1920, No. 1336, pp. 134–135), Dr. Slonaker describes a device for the simultaneous determination of the ages of two individuals at different times in their lives, involving the use of a calendar in which the days are numbered consecutively throughout the year. The present device obviates the need of the calendar and the need for resetting for dates in different years. As used with reference to human beings, two accessory scales aid in determining in years the age of an individual at different episodes in his life, when his present age and the years in which the episodes occurred are known, and vice versa.



Age-Computing Circular Slide Rule

2. A small disk 2 inches in diameter, a larger disk 3½ inches in diameter, and a 4½-inch square are cut from a sheet of opaque white celluloid and, with thin washers intervening, are pivoted at their centers on an eyelet. The square is cut further to present a semi-circular border from one end of the transverse diameter to the other. An adjust-

able pointer (P), bearing a median hair line throughout its length, is placed between the two disks and consists of a strip of transparent celluloid pivoted at one end on the eyelet and extending with a sharply pointed tip to the periphery of the larger disk.

3. Scale A, marked on the acircular sheet exetrnal to the circumference of the larger disk, is comprised of 365 equidistant radial lines numbered by tens from 0 (index a) to 360, representing successive days. Every seventh line if accented by a dot and numbered serially from 0 (index a) to 52, indicating weeks. An outer scale divides the circumference into twelve equal parts, each in turn divided into fourths, and is numbered from 0 to 11 to indicate months.

4. A coinciding scale (B) extends along the circumference of the larger disk but is graduated by months, the last line of each being prolonged centrally and the intervening spaces labelled with the names of the corresponding months. The index (b) of this scale is an accentuated line representing December 31.

5. An inner scale (C) on the same disk lies around the circumference of the smaller disk and, with 0 (index c) on the same radius as index b, divides the circumference into 100 equal parts. The lines are numbered by fives from 0 to 95 and represent successive years.

6. Individual years are represented by scale D on the smaller disk. This scale coincides with scale C and is numbered from '05 to 1900 (equivalent to any even hundred year). Attention is called to leap years by a dot on every fourth line from that of '04 to that of '98, inclusive. An erasable mark accentuates the present year.

ILLUSTRATIONS OF THE USE OF THE CIRCULAR SLIDE RULE

(a) To determine the interval between two dates less than 365 days apart. (The order in which the steps are taken is indicated by the numbers in the schematic diagrams.)

Scale A.		(3) At P, read the number of days (weeks or months).
Scale B.	(1) Set P at later date.	(2) At index a, set earlier date.

Example: Find the interval between May 21 and November 3.

Scale A.		(3) At P, read 166 days (23 weeks, 5 days, or 5 mos., 14 days).[1]
Scale B.	(1) Set P at November 3.	(2) At index a, set May 21.

In a leap year, if February 29 falls within the interval determined, 1 is to be added to the number of days indicated at P. This result is best obtained by advancing P one day in step (1), as follows:

Example: For the interval from July 5, 1919, to March 13, 1920.

Scale A.		(3) At P, read 252 days (or 8 mos., 9 days).
Scale B.	(1) Set P at March 14 (March 13 + 1).	(2) At index a, set July 5.

(b) To find the age on September 17, 1920, of an individual born March 23, 1867 (if the entire process were to be carried out):

[1] Although the reading in total days is invariably accurate (not considering leap year), readings in months and days may deviate from the customary calculation by not more than 3 days (because of the inequality of the calendar months). After the number of whole months is read, the number of days in the remainder may be determined accurately by rotating scale B, carrying P (already set at the later date) in the clockwise direction past index a until the first day represented by the same figure as the earlier date is at index a. Then, at P on scale A, read the number of days in the remainder. Thus, in the same example (from May 21 to November 3):

Scale A.		(3) At P, read 5 months.	(5) At P, read 13 days.
Scale B.	(1) Set P at November 3.	(2) At index a, set May 21.	(4) At index a, set October 21.

Scale *A*.			(6) At *P*, read 5 mos. 26 days.	(8) At *P*, read 25 days.
Scale *B*.	(2) Set *P* at Sept. 17	(3) At index *a* set Mar. 23.		(7) At index *a* set Aug. 23.
Scale *C*.			(5) Read 53 years.	
Scale *D*.	(1) Set '67 at index *c*.		(4) Opposite '20.	

In this example, since the earlier date (March 23) precedes the later date (September 17) within the same calendar year, *P* in step (6) lies within the sector extending clockwise from index *a* to index *b*. If the *later* date precedes the *earlier* date on scale *B*, *P* lies outside the sector similarly formed, and 1 must be subtracted from the number of years indicated in step (5). Thus, in the following example—an unusual case involving all the steps heretofore described—

Example: What is the age on March 3, 1920, of an individual born July 16, 1873?

Scale *A*.			(6) At *P*, read 7 mos. 19 days.	(8) At *P*, read 16 days.
Scale *B*.	(2) Set *P* at Mar. 4.	(3) At index *a* set July 16.		(7) At index *a* set Feb. 16.
Scale *C*.			(5) Read 47–1, or 46 years.	
Scale *D*.	(1) Set '73 at index *c*.		(4) Opposite '20.	

In step (3) it is seen that *P* lies outside the sector extending clockwise from index *a* to index *b* and accordingly 1 is subtracted from the reading in step (5). In step (2), correction is made for the occurrence of February 29 in the interval, and by steps (7) and (8) is obtained the correct reading of days in the remainder of the reading in months (step 6). The age, then, is found to be 46 years, 7 months, 16 days.

(*c*) To determine the period of liability in industrial insurance:

A new index (*a'*) may be marked on scale *A* at a point representing, in the counter-clockwise direction from index *a*, the number of days in the legal interval between the date of injury and the first day of compensation. For example, in Massachusetts, where compensation starts on the 15th day of incapacity, index *a'* is marked at 351. With the day of injury (scale *B*) set at index *a'*, the number of days of compensation may be read directly on scale *A* at the day on scale *B* representing the date of termination of disability.

Example: For what number of days shall compensation be paid to an employee injured on April 9 and incapacitated until August 5?

Scale *A*.		(3) At *P*, read 104 days (or 14 weeks, 6 days).
Scale *B*.	(1) Set *P* at Aug. 5.	(2) At index *a'* (351), set April 9.

(*d*) To find the decimal fraction of a year equivalent to a given number of days.

Example: What per cent. of a year is an interval of 211 days?

Scale *A*.		(2) Set *P* at 211.
Scale *B*.	(1) Set index *b* at index *a*.	
Scale *C*.		(3) At *P*, read 58 per cent.

Or, to find the number of days equivalent to a decimal fraction of a year:

Example: What is the equivalent in days of .36 year?

Scale *A*.		(3) At *P*, read 131 days.
Scale *B*.	(1) Set index *b* at index *a*.	
Scale *C*.		(2) Set *P* at 36.

7. The device may, of course, be made in any desired size but the dimensions given seem the most convenient, and the acircular shape of the base facilitates locating index *a*. Indelibility is obtained by engraving the lines with a steel point and filling with India ink.

8. Illustrations of the use of this compound circular slide rule are given above.

C. M. KELLEY

PSYCHOLOGICAL LABORATORY OF
MCLEAN HOSPITAL

MEETING OF COMMITTEES ON CONSERVATION

COMMITTEES on Conservation appointed by the National Academy of Sciences, the National Research Council, and the American Association for the Advancement of Science met jointly in the American Museum of Natural History, New York City, April 9, to consider the present status of the conservation movement from the point of view of science, means for increasing the coordination of the numerous agencies interested in the various aspects of conservation, and particularly the far-reaching relation of the principles of the conservation of natural resources to the economic and social welfare of the country. The members present at this meeting were: J. C. Merriam, chairman of three committees, Isaiah Bowman, J. McK. Cattell, John M. Clarke, Henry S. Graves, Vernon Kellogg, C. E. McClung, and Barrington Moore, and by invitation Willard G. Van Name.

The point of view of the committees and the major considerations discussed at this meeting are stated in an address which Mr. Graves presented at this meeting and which is published in full elsewhere in this issue of SCIENCE.

It was the unanimous opinion of the members of the committees that an organization should be effected representing the scientific men of the country, and that the functions of this organization, broadly speaking, should be as follows:

1. To bring scientific research to bear more effectively upon the problems of conservation. This involves the extension among research men of a knowledge of the scope, the objectives, and the economic problems of conservation, and the assurance that in the studies of each resource there is an appreciation of its relation to other resources, and the correlation of the programs of research in each field of work.

2. To assemble the available data relating to our natural resources, and the interpretation of these data from the standpoint of conservation and of the relation of the problems of the various resources, severally and taken together, to the economic, industrial, and social welfare of different regions and of the nation as a whole. This work is essential for an adequate definition of our conservation problems, and to furnish the economic background for the many proposals for public action by the states and by the federal government.

3. To bring about the introduction in our educational institutions of instruction in the principles underlying conservation. The plan of instruction should be subject to great variation in different institutions. The instruction might be given in connection with courses in economic or political and social science, or economic and industrial history, or in connection with various courses in engineering and applied science, or in special courses in conservation.

The undertaking would involve personal contact and cooperation with the institutions or educational organizations. It would involve further suggestions as to the preparation of text-books and special material for demonstration, such as charts, models and maps, and suggestions regarding the methods of instruction.

4. To effect leadership in a campaign of popular education as to the meaning of conservation, and the necessity for the adoption of its principles.

5. To bring into effective harmony the efforts of the different forces of the country concerned with conservation based upon scientific research which it is difficult for any of the existing agencies to effect.

The following resolution was adopted to be reported for approval to the National Academy of Sciences, the National Research Council, and the American Association for the Advancement of Science:

Resolved: That it be recommended by the committees appointed by the American Association for the Advancement of Science, the National Academy of Sciences, and the National Research Council that they form a continuing joint committee on national conservation representing those organizations, and that this committee be authorized to set up an executive and secretarial agency for the active prosecution of its work.

To carry forward the purposes of this resolution the following motions were passed:

Moved: That a Project Committee of three members be appointed by the chairman to draw up a plan of action to be presented to a Ways and Means Committee for execution.

Moved: That a Ways and Means Committee be appointed by the chairman to consist of one representative each from the National Academy of Sciences, National Research Council, and American Association for the Advancement of Science; and, conditioned upon the approval of the resolution just adopted, by these three organizations, to undertake (1) to secure means for meeting the comparatively small expenses of these three initial committees, and (2) to secure larger funds for the permanent support of a conservation movement as outlined in this discussion.

The resolution adopted by these committees has been approved by the Council of the National Academy of Sciences, the Executive Board of the National Research Council, and the Council of the American Association for the Advancement of Science at the recent meetings of those bodies and funds have been provided for defraying the immediate expenses of these committees.

Albert L. Barrows,
Secretary, pro tempore

THE WESTERN SOCIETY OF NATURALISTS—SAN JACINTO SECTION

The San Jacinto Section of the Western Society of Naturalists held its spring meeting in San Diego and La Jolla, California, on Friday and Saturday, April 1 and 2, 1921. The Friday session convened at 2:30 at the San Diego Museum of Natural History in Balboa Park, President H. S. Reed, of Riverside, presiding. The following papers were presented at this session:

Bryan, W. A. (Museum of History, Science, and Art, Los Angeles): "Observations on the fauna and flora of some seldom visited Pacific islands."

Sumner, F. B. (Scripps Institution for Scientific Research, La Jolla): "Responsibility of the biologist in the matter of preserving natural conditions."

Taylor, W. P. (Bureau of Biological Survey, Dept. of Agriculture): "Distribution of mammals and birds on Mount Ranier."

Frost, H. B. (Citrus Experiment Station, Riverside): "International language in relation to science."

Conklin, E. G. (Princeton University): "The chromosome theory of heredity applied to ontogeny and phylogeny."

Carsner, Eubanks (Bureau of Plant Industry, U. S. Dept. Agr.): "A serious disease of the sugar-beet in California."

The society adjourned at 6:00 o'clock to the San Diego Hotel for the annual dinner and a short business meeting at which Dr. F. B. Sumner, of the Scripps Institution, La Jolla, was elected president for the coming year, and Dr. F. J. Smiley, of Occidental College, Los Angeles, re-elected secretary. After the business meeting the following papers were presented:

Essenberg, Christine (Scripps Institution): "An interesting group belonging to the marine fauna of San Diego Bay."

Allen, W. E. (Scripps Institution): "Investigation of the ocean pasturage."

Halma, F. E. (Citrus Experiment Station): "Regeneration of the roots of sour orange."

Barnhart, P. S. (Scripps Institution): "Observations on the habits of the trap-door spider."

Saturday morning the section assembled in La Jolla and visited Torrey Pines Park, a reservation for the protection of one of California's rarest trees (*Pinus Torreyana* Parry). The afternoon was devoted to an inspection of the Scripps Collection of Watercolors illustrating the flora of California at the home of Miss Ellen Scripps, and to visiting the Scripps Institution.

The next meeting is to be held at the call of the president and secretary.

F. J. Smiley,
Secretary